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A Review of the Labrid Genus *Paracheilinus*, with the Description of a New Species from Melanesia[1]

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ABSTRACT: The genus *Paracheilinus* Fourmanoir, previously known from a single specimen collected in the Red Sea, is reviewed and a new species is described from New Guinea and the Solomon Islands. *Paracheilinus*, which was not adequately defined when introduced by Fourmanoir, is a member of the labrid subfamily Cheilininae, which also includes *Cheilinus*, *Cirrhilabrus*, *Pseudocheilinops*, and *Pseudocheilinus*. It appears to be closely allied to *Cirrhilabrus*. The two genera are similar in body shape, dentition, and behavior. *Paracheilinus filamentosus* n.sp. differs from *P. octotaenia* Fourmanoir primarily on the basis of color pattern and shape of the head, dorsal fin, and caudal fin.

FOURMANOIR (1955) introduced the genus *Paracheilinus* in his description of *P. octotaenia*, but did not include a formal generic definition. The genus and species were described on the basis of a single specimen, 64 mm standard length, collected in the Red Sea.

During April–May 1972, I collected fishes at Madang, New Guinea, aboard Walter A. Starck's research vessel *El Torito*. The collections were made with SCUBA by means of rotenone, quinaldine, and small multiprong spears. They include seven specimens of a new *Paracheilinus*, which is described herein. Additional specimens were procured by J. Randall and me during an expedition to the Solomon Islands during July 1973. In addition to the description of *P. filamentosus* n. sp., a brief review of *Paracheilinus* and discussion of its relationships are included.

Type specimens have been deposited at the Australian Museum, Sydney (AMS), Bernice P. Bishop Museum, Honolulu (BPBM), and Muséum National d'Histoire Naturelle, Paris (MNHN). All measurements were made with needle-pointed dial calipers. Lengths are expressed as standard length (SL).

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GENUS *Paracheilinus* FOURMANOIR

Paracheilinus Fourmanoir, 1955. Ann. Inst. Océanogr. Monaco 30: 199, fig. 1 (genotype, *Paracheilinus octotaenia* Fourmanoir, by original description).

Diagnosis

A genus of the labrid subfamily Cheilininae with the following combination of characters: dorsal spines usually IX (VIII in holotype of *P. filamentosus*); soft dorsal rays 11; soft anal rays 9; lateral line interrupted, margin of preopercle entire; mouth small, slightly protractile; three pairs of canines at front of upper jaw, bent outward and backward; single pair of enlarged canines at front of lower jaw, bent outward and backward; caudal fin slightly rounded, emarginate, or strongly lunate; a series of six to eight dark stripes on sides.

Remarks

The subfamily Cheilininae was defined by Norman (1966) as follows: occipital and parietal crests strong, extending forward to above the anterior margins of the orbits; lower pharyngeal plate T-shaped; dorsal fin rays IX to XI, 9 to 11; anal fin rays III, 8 to 9. In addition to *Paracheilinus* the subfamily contains *Cheilinus* Lacépède, *Cirrhilabrus* Schlegel, *Pseudocheilinops* Schultz, and *Pseudocheilinus* Bleeker. Roux-

TABLE 1

A COMPARISON OF SELECTED CHARACTERS OF THE GENERA OF CHEILININAE

CHARACTER	*Cheilinus*	*Cirrhilabrus*	*Paracheilinus*	*Pseudocheilinops*	*Pseudocheilinus*
Dorsal Rays	IX to X, 9 to 11	XI to XII, 8 to 10	VIII to IX, 11	IX, 11	IX, 11
Anal Rays	III, 8 to 9	III, 9	III, 9	III, 9	III, 9
Pectoral Rays	12	15 to 16	14	13	14 to 16
Canines (Upper Jaw)	2 to 4	6	6	4	6 to 8
Edge of Preopercle	entire	serrate	entire	serrate	entire
Second Anal Spine in Relation to Third	longer	shorter	shorter	shorter	shorter
Caudal Fin	emarginate to rounded	rounded	slightly rounded to lunate	rounded	rounded

Estève (1956) stated that the genus *Paracheilinus* is related to *Cheilinus* and *Pseudocheilinus*; to the former by virtue of the second anal spine that is shorter than the third, and to the latter because of similar dentition in which the canines are bent outward. Although several morphological features are shared by *Paracheilinus* and *Pseudocheilinus* (see Table 1), these genera are clearly distinct particularly with regard to head shape and lip structure. The snout of *Paracheilinus* is noticeably more blunt, usually fitting more than 4.0 in the head length, whereas that of *Pseudocheilinus* is produced (2.7 to 3.1 in the head length). The lips of the latter genus form enlarged, plicate folds. The lower lip is particularly apparent, measuring nearly half an eye diameter at its widest point. By contrast, the lips of *Paracheilinus* are small and scarcely visible when the mouth is closed. It is my opinion that the genus is most closely related to *Cirrhilabrus*. It is very similar to this genus in body shape, dentition, and behavior. The members of both genera spend a good deal of time feeding on plankton a short distance above the substratum. *Cheilinus* and *Pseudocheilinus*, however, are bottom-dwelling fishes that feed on benthic organisms. The canine teeth of *Cirrhilabrus*, which consist of a pair of small canines at the front of the upper jaw with two pair of larger canines on each side, and a pair of medium-sized canines on each side of the symphysis of the lower jaw, are very similar to those of *Paracheilinus* except they are not flared outward as strongly (the inner pair of the upper jaw is straight). It is easy to understand how the affinity of *Cirrhilabrus* escaped the attention of Roux-Estève as the genus is poorly known, consisting of three known species (western Pacific, 2; Hawaiian Islands, 1) and a host of undescribed forms, most of which are housed at the Bernice P. Bishop Museum, Honolulu. At present it has not been reported from the Red Sea or Indian Ocean. John E. Randall intends to revise the genus in the near future. The salient characters of *Paracheilinus*, *Cheilinus*, *Cirrhilabrus*, and *Pseudocheilinus* are compared in Table 1.

KEY TO THE SPECIES OF *Paracheilinus*

1a. Soft dorsal rays not produced into filaments; caudal fin slightly rounded; about eight dark strips on body (Red Sea) ..... *octotaenia* Fourmanoir

1b. Several of the soft dorsal rays produced into elongate filaments (at least in specimens over 30 mm SL); caudal fin emarginate or lunate; about six dark stripes (usually only three apparent in preserved specimens) (New Guinea; D'Entrecasteaux Group; Solomon Islands) .....*filamentosus* n. sp.

FIG. 1. *Paracheilinus octotaenia*, 69 mm standard length, Red Sea (photo by J. E. Randall).

Paracheilinus octotaenia Fourmanoir

Fig. 1

Paracheilinus octotaenia Fourmanoir, 1955. Ann. Inst. Océanogr. Monaco 30: 199, fig. 1 (type locality, Abulat Island, off the Arabian coast, Red Sea).

Diagnosis

Dorsal rays IX, 11; anal rays III, 9; pectoral rays, 14; gill rakers 16; lateral line scales 15+7; predorsal scales 5.

The following proportional measurements were taken from the holotype, 59.5 mm SL: depth 3.3, head 3.4, both in the SL; snout 4.0, eye 3.8, interorbital 3.9, least depth of caudal peduncle 2.2, pectoral fin 1.2, pelvic fin 1.5, middle caudal rays 1.2, all in the head length.

Color of holotype in alcohol reddish brown on back, paler on sides with eight bluish stripes (one per scale row); three bluish lines radiating from posterior edge of eye extending to edge of opercle, lowermost extended on to snout; blue line across interorbital connecting eyes; dorsal and anal fins yellowish.

Remarks

The holotype, which is deposited at Paris (MNHN 52-296), was examined by me. This specimen was collected with explosives by the crew of the *Calypso*. A drawing of this specimen which accompanies the original description indicates that the membranes between the dorsal spines are produced into short filaments. However, eight specimens (25 to 69 mm SL) recently collected by J. E. Randall at the Gulf of Aqaba, Red Sea, have a uniform dorsal fin outline without filaments (see Fig. 1). The dorsal filaments of the holotype probably represent torn fin membranes. Five of the

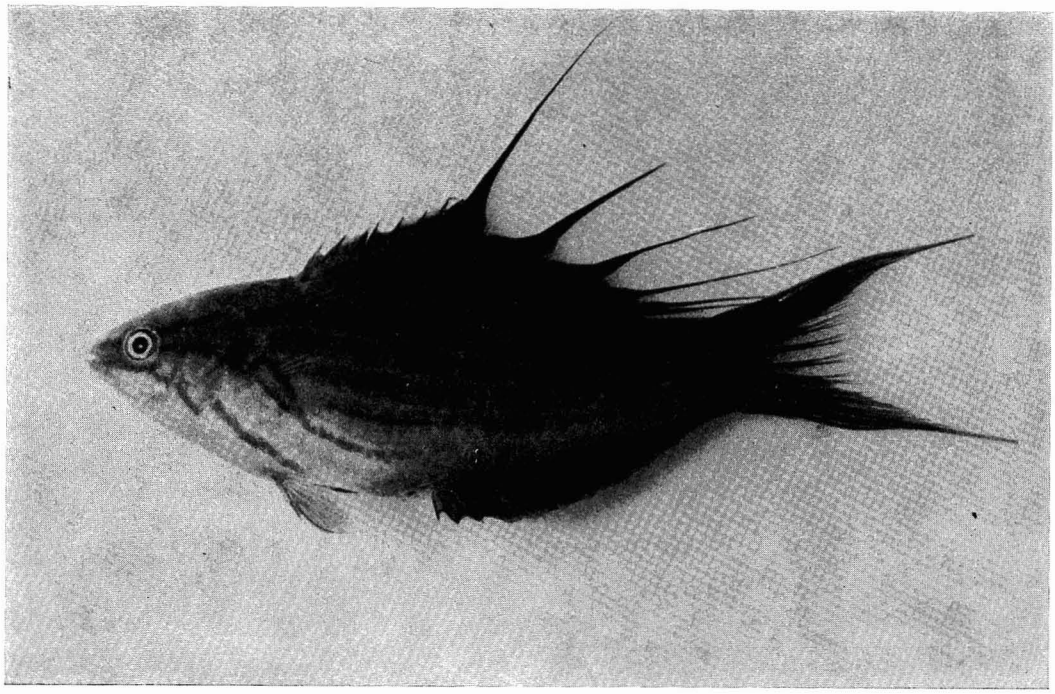

FIG. 2. *Paracheilinus filamentosus*, holotype, 62.6 mm standard length, New Guinea.

specimens collected by Randall are males (60 to 69 mm), two are mature females (34 and 37 mm), and one (24 mm) is immature. The latter has a blackish spot about the size of the pupil at the caudal base, just above the lateral line. Randall (personal communication) reports that in preservative the males have more conspicuous stripes on the body. Also they have distinct black submarginal lines on the soft part of the dorsal and anal fins, and posteriorly on the caudal fin. These markings are entirely lacking in the females. In addition, the median fins of the male are higher than those of the female.

Paracheilinus filamentosus n. sp.

Fig. 2; Table 2

Diagnosis

A species of *Paracheilinus* with the following combination of characters: dorsal rays VIII or IX, 11; anal rays III, 10; pectoral rays 14; gill rakers 13 to 16; adults and larger subadults with several of the soft dorsal rays produced into elongate filaments; caudal fin slightly emarginate in young, strongly lunate in adults.

Holotype

AMS I.16994-001, male, 62.6 mm SL, collected with rotenone on outer reef off northern end of Kranket Island (5°11′24″ S, 145°50′54″ E), about 2 nautical miles north of Madang, New Guinea, in 32 meters by G. Allen on 10 April 1972.

Paratypes

AMS I.16995-001, four specimens, 19.3 to 29.1 mm SL, collected with the holotype; AMS I.17479-001, 53.5 mm SL, collected with spear and quinaldine near Tassafaronga Point (approximately 9°22′ S; 159°52′ E), Guadalcanal, Solomon Islands, in 30 meters by G. Allen on 5 July 1973; AMS I.17496-001, 11 specimens, 28.9 to 57.0 mm SL, collected with dynamite at Alite Reef (approximately 8°52′ S; 160°36′ E), off Malaita, Solomon Islands, in 15 meters by G. Allen, B. Goldman, J. Randall,

TABLE 2

MORPHOMETRIC PROPORTIONS (IN THOUSANDTHS OF THE STANDARD LENGTH) OF SELECTED TYPES OF *Paracheilinus filamentosus*

CHARACTERS	HOLOTYPE (♂) AMS I. 16994-001	PARATYPE (♂) BPBM 14658	PARATYPE (♀) MNHN 1973-7	PARATYPE (JUV.) AMS I. 16995-001
Standard Length	62.6	55.3	45.9	29.1
Greatest Body Depth	328	327	331	306
Greatest Body Width	152	152	157	158
Head Length	315	311	316	347
Snout Length	85	71	65	76
Eye Diameter	64	69	76	96
Interorbital Width	75	72	78	76
Least Depth of Caudal Peduncle	144	150	146	144
Length of Caudal Peduncle	147	166	142	141
Snout to Origin of Dorsal Fin	326	304	325	368
Snout to Origin of Anal Fin	566	528	590	660
Snout to Origin of Pelvic Fin	355	335	331	374
Length of Dorsal Fin Base	524	566	549	516
Length of Anal Fin Base	299	289	279	247
Length of Pectoral Fin	201	208	214	203
Length of Pelvic Fin	161	165	153	182
Length of Pelvic Spine	93	98	102	134
Length of 1st Dorsal Spine	damaged	42	37	48
Length of Last Dorsal Spine	158	157	148	151
Longest (1st) Soft Dorsal Ray	516	515	331	210
Length of 1st Anal Spine	58	58	59	89
Length of 3rd Anal Spine	90	90	102	120
Longest (last) Soft Anal Ray	224	213	148	138
Length of Middle Caudal Rays	198	204	233	251

and W. Starck on 25 July 1973; BPBM 14658, six specimens, 34.5 to 65.0 mm SL, collected with the holotype; MNHN 1973-7, a female, 45.9 mm SL, collected with the holotype.

Description

Counts are recorded for the holotype, followed in brackets by data for 13 selected paratypes when differing from the holotype. Proportional measurements appearing in parentheses apply to paratypes in excess of 40 mm SL when differing from the holotype. Morphometric proportions expressed in thousandths of the standard length for the holotype and three selected paratypes are presented in Table 2.

Dorsal rays VIII, 11 [IX, 11 (13)]; anal rays III, 9; pectoral rays 14; pelvic rays I, 5; branched caudal rays II; lateral line scales 16+6 [15+6 (1), 15+7 (2), 15+8 (1), 16+6 (6), 16+10 (1), 17+5 (1), 17+6 (1)]; predorsal scales 5, a single row of large scales between anterior part of lateral line and dorsal fin and six rows between anterior part of lateral line and anal fin; a row of oblong scales at base of dorsal and anal fins, and several enlarged scales at caudal base; head scaled except occiput, interorbital, preorbital, snout, lips, and lower jaw; gill rakers on first gill arch 16 [12 (1), 13 (7), 14 (3), 15 (2)].

Body elongate and compressed, its greatest depth 3.1 (3.0 to 3.3) in the standard length. Width of body at gill opening 2.2 (1.9 to 2.2) in the depth. Head conical and laterally compressed, its length 3.2 (2.9 to 3.2) in the standard length. Snout 3.7 (4.4 to 4.8), eye 4.9 (3.6 to 4.5), interorbital width 4.2 (4.0 to 4.6), least depth of caudal peduncle 2.1 (1.9 to 2.5), length of caudal peduncle 2.1 (2.0 to 2.4), of pectoral fin 1.6 (1.4 to 1.7), of pelvic fin 2.0 (1.9 to 2.1), of middle caudal rays 1.6 (1.4 to 1.5), all in the head length.

Origin of dorsal fin at about level of upper pectoral base; dorsal spines slender, but

pungent, gradually increasing in length to last spine; first dorsal spine damaged in holotype (7.2 to 8.5), last dorsal spine 2.0 (2.0 to 2.4), both in the head length; several of the soft dorsal rays produced into elongate filaments, the first 1.9 (1.9 to 4.7) in the standard length; first anal spine 5.5 (3.9 to 5.4), last anal spine 3.5 (2.9 to 3.4), both in the head length; last soft anal ray the longest 1.4 (1.5 to 2.5) in the head length; caudal fin emarginate in juveniles and adult females to strongly lunate in adult males.

Three pairs of tusklike canines at front of upper jaw, flared laterally and hooked posteriorly, outer pair enlarged; single pair of enlarged canines, similarly positioned at front of lower jaw; small conical teeth behind canines at front and side of jaws, mostly uniserial, except biserial to multiserial at anteriormost and posteriormost section of jaws.

Pores of cephalic lateral line system small and inconspicuous, in several series; a series of 11 circumorbital pores with secondary row of two pores on snout; a preopercle-dentary series of three pores on lower jaw, a fourth below middle of eye near lower edge of preopercle and a fifth near angle of preopercle; a series of four pores across nape.

Color in Alcohol

Head and body of holotype pale green; snout slightly bluish; oblique brownish stripe extending from upper corner of opercle, along lateral line to fourth scale; three narrow brown stripes radiating from posterior edge of eye, upper two extending to edge of opercle, lowermost extending about halfway across preopercle; three similar broken stripes on body, one on each of first three scale rows below lateral line, uppermost extending to anterior part of caudal peduncle, two lowermost very faint and extending to about middle of body; several short brownish streaks between upper edge of opercle and origin of first few dorsal spines; membranes of dorsal, anal, and caudal fins translucent, spines and rays blue; diffuse blackish band at base of soft dorsal and faint dark band near margin of spinous and soft dorsal; pelvic and pectoral fins pale.

The colors of the three largest paratypes are similar except that the stripes on the body of the two smaller of these (both females) are more vivid and the blue coloration of the fin rays is less intense. The three smallest paratypes are basically pale green with transparent fins and with only a faint trace of the body stripes.

Color in Life

Ground color orange; head with several purple lines radiating from eye; sides with five fuchsia stripes below lateral line, each about one scale wide, additional stripe just below dorsal fin; lower portion of head, breast, and abdomen pink; dorsal fin mostly orange; anal and caudal fins mostly red; dorsal, anal, and caudal fins with pale purplish blue margins, also a broad band of this color near base of soft dorsal fin; pelvic fins faintly purple; pectoral fins translucent.

Remarks

This species was relatively common at Madang, New Guinea, and off Guadalcanal, Solomon Islands. It frequents the outer reef and the edges of deeper channels running into protected inshore lagoon areas. It was also observed at Fergusson Island, D'Entrecasteaux Group, commonly occurring in aggregations numbering from a few to about 20 or 30 individuals. They appear to spend much of the time feeding on zooplankton about 1 meter or more above the substratum. The species was observed at depths ranging from about 5 to 35 meters.

As in many labrids, sexual dimorphism is exhibited by *P. filamentosus*. Males tend to be brighter colored, have more elongate dorsal ray filaments, and a more lunate caudal fin. Spawning was observed near the type locality on several occasions. During this activity one or two males accompanied by a group of smaller females repeatedly formed tight aggregations a short distance above the substratum. This activity was followed by a rapid vertical dash for a short distance, followed by an abrupt return to the bottom with the fish releasing a visible cloud of milt and eggs at the apex of the ascent. During spawning periods the males continually confront female members of the aggregation with a spectacular display in which

the male pauses momentarily and erects the filamentous dorsal fin. The 45.9 and 29.1 mm paratypes are females with eggs.

In addition to the characters indicated in the key, this species differs from *P. octotaenia* in head shape. The head of the latter species is deeper and has a slight hump on the forehead which is lacking in *P. filamentosus*.

Named *filamentosus* in reference to the elongate dorsal filaments.

Addendum

Additional specimens (United States Museum of Natural History catalog number 209923, seven specimens, 15-32 mm SL) were recently sent to me by V. G. Springer. These were collected at Saparua, Molucca Islands, Indonesia.

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